FY-2001 PROPOSED SCOPE OF WORK for: **Project #:** 108

Determination of Winter Use and Seasonal Flow Needs
of Colorado Pikeminnow in the Lower Price River

Lead Agency: Utah Division of Wildlife Resources

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Date: May 15, 2000 (Revised)

Category:
_ Ongoing project
_ Ongoing-revised project
X Requested new project
_ Unsolicited proposal

Expected Funding Source:
X Annual funds
_ Capital funds
_ Other (explain)

I. Title of Proposal:

Determination of Seasonal Use and Flow Needs of Colorado Pikeminnow in the Price River

II. Relationship to RIPRAP:

Protection of flows in the Price River will:

1) aid recovery of endangered fish species,
2) protect remaining habitat within the Price River, and
3) contribute to maintaining flows in the Green and Colorado Rivers.

General Recovery Program Support:

V. Monitor populations and habitat and conduct research to support recovery actions (research, monitoring, and data management)

Green River Action Plan:

I.C. Price River

I.C. 2. Determine winter use and seasonal flow needs for Colorado pikeminnow in the Price River

III. Study Background/Rationale and Hypotheses:

Historically, large numbers of native fish including Colorado pikeminnow, flannelmouth suckers, bluehead suckers, speckled dace, roundtail chubs, and possibly razorback suckers inhabited the Price River (Quartarone 1993). Impacts resulting from development (i.e., dams, water diversions, water pollution, mineral extraction, highways, railroads, etc.) led to a reduction in native fish numbers throughout the Green and Colorado river systems. The native fish community in the Price River experienced all of these impacts. According to anecdotal accounts and early fish sampling, the native fish community in the Price River appears to have been severely impacted since the early part of the 20th century due to both biotic and physical changes. The extent of these instream habitat and flow alterations is not well understood, nor is the effect on the native fish community, including the endangered Colorado pikeminnow.

Endangered fish were absent from fish surveys in the Price River from the 1950s to the late 1970s. In fact, most biologists familiar with the system believed that endangered fish had been completely extirpated from this river. At the time that the endangered fish of the Colorado and Green rivers were beginning to be studies in earnest in the late 1960s and 1970s, researchers concluded these species to be mainly large river fish that dwelled in the main channels of the Green and Colorado rivers and not within their tributaries. As a result, research and recovery efforts focused on the mainstem systems and tributary communities were largely ignored.

With the proposed construction of the Narrows Dam Project in the headwaters of the Price River, Trout Unlimited sponsored a single, 5-day sampling trip in the lower 20 miles of the Price River to determine the status of the existing fish community. This survey resulted in the capture of one juvenile Colorado pikeminnow 2.2 miles above the confluence of the Green River. Although possibly anomalous, the capture of this endangered fish was enough to prompt the Bureau of Reclamation to reinitiate consultation with the US Fish and Wildlife Service (Service) to determine if the Narrows Dam Project was likely to adversely affect Colorado pikeminnow. Because so little was

known about the fish community in the Price River in 1995, a two-year study was initiated to determine the status of the fish community and the presence of endangered fish in the lower 50 miles.

The 2-year study, conducted from April through October in 1996 and 1997, unexpectedly found that juvenile and adult Colorado pikeminnow occupy the Price River in densities comparable to other important reaches of the Green and Colorado river. Over 20 Colorado pikeminnow were captured ranging in size from just over 150 mm to nearly 600 mm (Cavalli 1999). In 1998, a Colorado pikeminnow was captured in the Price River 83.5 miles above the confluence with the Green River, and two more Colorado pikeminnow were captured at the base of the Farnham Diversion in 1999. The Farnham Diversion appears to be a barrier to further upstream movement.

The above findings suggest that the Price River may be biologically important to the Green River populations of Colorado pikeminnow. However, it is not known if the Colorado pikeminnow occupy the Price River seasonally or year-round. In addition, the discovery of substantial numbers and different life-stages of Colorado pikeminnow in the Price River when compared to fish surveys in the 1960s and 1970s suggest that Colorado pikeminnow may be expanding their range into previously vacant areas. These findings also may indicate that tributaries provide substantial habitat opportunities for a recovering population of endangered fish.

Because researchers did not expect to find abundant Colorado pikeminnow in the Price River when the two-year study was initiated, the study was not designed to determine year-round and seasonal use or to determine flow requirements; rather the two-year study was directed at determining the extent of endangered fish use and characterizing habitat. Furthermore, the study was limited to the lower 50 miles of the Price River, however, we now know that Colorado pikeminnow occupy the entire 88.5 miles of available habitat. Some cursory data on general habitat conditions as well as use by Colorado pikeminnow from April through October were documented during the two-year study. However, this information is not sufficient to know if Colorado pikeminnow occupy the Price River from November through March; neither is it sufficient to make flow recommendations, particularly because there is no active discharge gage station on the Price River and no accurate flow information available.

Currently, Bureau of Reclamation is awaiting a final Biological Opinion from the Service on the Narrows Dam Project. One likely Reasonable and Prudent Alternative (RPA) of such an opinion would be to collect additional information to understand the role of the Price River to Colorado pikeminnow recovery and to develop flow recommendations that will protect endangered fish. This is particularly important with future projects such as reoperation of Scofield Reservoir approaching. A study designed to confirm potential year-round use and to determine flows that will protect Colorado pikeminnow in the Price River would provide important information for use in future Section 7 consultations.

IV. Study Goals, Objectives, End Product:

The objectives of this research are to:

1. Determine if the lower Price River is used by Colorado pikeminnow from October through March.

2. Determine seasonal flows that will protect Colorado pikeminnow and their habitats and allow their continued use of the Price River.

3. Develop year-round flow recommendations for Colorado pikeminnow in the lower Price River.

This research will be synthesized into a final report which documents the data collected and provides recommendations for the flows needed to protect Colorado pikeminnow and provide adequate habitats during the times of year that they are present.

V. Study Area:

This study will be conducted in the section of the Price River bounded by the confluence with the Green River (River Mile 0.0) and Farnham Diversion Dam (River Mile 88.5).

VI. Study Methods/Approach:

The portion of the Price River from the confluence with the Green River to Farnham Diversion (88.5 river miles) can naturally be divided into four geomorphic reaches. A one-mile long characteristic subreach within each geomorphic reach will be selected. Each subsection will be sampled every other month. Electrofishing will be the primary sampling gear. This information will allow a comparison between catch rates in the winter with other times of year when Colorado pikeminnow are known to be present.

Five cross-sections will be permanently marked within each one-mile subreach. After electrofishing the one-mile subreach, habitat information will be collected at the five cross-sections. One cross-section per subreach will be located specifically in a shallow-water habitat (riffle or top of rapid) to facilitate development of minimum passage flows. The other four cross-sections will be spaced equally throughout the one-mile subreach. Within each of the five standard cross-sections, wetted width of the cross-section will be measured and recorded. In addition, water depth, water velocity (at 0.6 depth), substrate, and cover will be measured and recorded at ten equally spaced points on each cross section. This information will be used to relate macrohabitat characteristics to flow conditions in the event that captures of Colorado pikeminnow are too rare to develop strong statistical relationships. The point of these cross-sections is not to artificially infer habitat needs. Rather, where such a small subreach is sampled, it is likely that few Colorado pikeminnow would be captured yet densities could be high overall. Colorado pikeminnow habitat use data collected by other researchers (e.g. Tyus, Valdez, Burdick), as well as information collected on fish captured in this study, will be used to determine the relationship between discharge and the range of habitat characteristics needed by

Colorado pikeminnow. By correlating fish presence with habitat characteristics and those habitat characteristics with flows, a relationship between fish and flows can be established.

In addition to fish and habitat sampling within each subreach, an ocular estimate of habitat composition (percent of pool, riffle, rapid, and run) will be recorded for each subsection. Although subjective by nature, this technique provides broad-scale examination of macro-habitat changes without the expense and time of more sophisticated technologies. More comprehensive fish sampling within a 10-15 mile subreach of each of the 4 geomorphic reaches will be conducted twice annually (spring and fall). These comprehensive fish surveys will provide information on general catch rates that can be compared among seasons, years and to previous study results. Seining designed to determine the presence of young-of-year Colorado pikeminnow will compliment the comprehensive sampling.

The Price River can be covered with ice for two or three months each year. Therefore, scheduled sampling at the subreach level may not be possible during at least one of the winter months. In order to determine whether Colorado pikeminnow are using the Price River during this period, radio tags will be implanted into 5 to 10 juvenile or adult Colorado pikeminnow captured in late fall. These fish will be monitored each month to determine whether they stay in the Price River or move to the Green River during the winter months.

The final report will include a discussion of the options available to protect flows and habitat, and a discussion of the recovery potential of the Price River. Fish use and habitat availability will be related to flows using data collected at the USGS gauge located at Woodside, Utah, assuming this gauge is recommissioned before FY-2001. In addition, the current flow regime will be compared to that recorded in historic gauge data. The gauge is currently not functional, but funds to recommission this gauge have been obtained from the U.S. Bureau of Reclamation and the RIP has indicated a commitment to pay for operating expenses. Gauge costs will be requested through a separate SOW.

VII. Task Description and Schedule:

Task 1. Determine if Colorado pikeminnow use the Price River throughout the year.

- Fish and habitat will be sampled in one mile subreaches within 4 geomorphic reaches in the lower 88.5 river miles every other month from October 2000 through August 2002. This data will be related to discharge data collected at the USGS gauge at Woodside, Utah.

- Radio tags will be implanted in Colorado pikeminnow during the fall of 2000 and 2001 and these fish will be monitored during the winter months.

Task 2. Determine seasonal flow needs of Colorado pikeminnow in the Price River.

- Conduct an analysis relating habitat availability and characteristics and Colorado pikeminnow use of the Price River to flows.

- Work on this task will begin when fieldwork has been completed. A preliminary analysis will be completed annually.

Task 3. Develop year-round flow recommendations for Colorado pikeminnow in the lower Price River.

- Examine current and historic gauge data, Colorado pikeminnow use of the river, and habitat availability and characteristics.

- This task will be addressed after all field data has been collected and will be incorporated in the final report.

VIII. FY-2001 Work:

Deliverables/Due Dates
-RIP annual progress report (12/00)

Budget

Labor (salary and benefits)	$26,000
Travel (mileage and food)	7,000
Equipment (flow meter, dry suit, etc.)	5,000
Other (computer costs, printing, etc.)	2,000
Total	$40,000

FY-2002:

Deliverables/Due Dates
-RIP annual progress report (12/01)
-Draft Final report (1/03)

Budget

Labor (salary and benefits)	$28,500
Travel (mileage and food)	7,000
Equipment (repair and replacement)	2,500
Other (computer costs, printing, etc.)	2,000
Total	$40,000

IX. Budget Summary:

FY-2001	$40,000
FY-2002	$40,000
Project Total	$80,000

X. Reviewers:

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XI. References:

Cavalli, P.A. 1999. Fish community investigations in the lower Price River, 1996-1997. Final Report prepared for the Recovery Implementation Program for Endangered Fishes in the Upper Colorado River Basin. Project No. 78.

Quartarone, F. 1993. Historical accounts of upper Colorado River Basin endangered fish. Recovery Implementation Program for Endangered Fish of the Upper Colorado River Basin. 66 pages.